

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference T 45241WO/NZ/hs	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. PCT/EP2004/006466	International filing date (<i>day/month/year</i>) 16.06.2004	Priority date (<i>day/month/year</i>) 25.06.2003	
International Patent Classification (IPC) or national classification and IPC G06K19/06, B42D15/00, B42D15/10			
Applicant OVD KINEGRAM AG			

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 14 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

a. ☒ (sent to the applicant and to the International Bureau) a total of 6 sheets, as follows:

☐ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

<input checked="" type="checkbox"/>	Box No. I	Basis of the report
<input type="checkbox"/>	Box No. II	Priority
<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/>	Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/>	Box No. VI	Certain documents cited
<input type="checkbox"/>	Box No. VII	Certain defects in the international application
<input type="checkbox"/>	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-23 _____ as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☒ the claims:
- nos. _____ as originally filed/furnished
- nos.* _____ as amended (together with any statement) under Article 19
- nos.* 1-25 received by this Authority on 04.05.2005 with letter
- nos.* _____ received by this Authority on of 02.05.2005
- ☒ the drawings:
- sheets 1/12-12/12 _____ as originally filed/furnished
- sheets* _____ received by this Authority on _____
- sheets* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages _____
- ☐ the claims, nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to sequence listing (*specify*): _____
4. ☒ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages _____
- ☐ the claims, nos. 1, 24 _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	4-15, 20, 21, 24	YES
	Claims	1-3, 16-19, 22, 23, 25	NO
Inventive step (IS)	Claims	12-15, 21	YES
	Claims	1-11, 16-20, 22-25	NO
Industrial applicability (IA)	Claims	1-25	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

1 Reference is made to the following documents:

D1: US-B1-6 324 004
D2: DE 100 44 465 A
D3: WO 02/100653 A
D4: EP-A-0 520 363
D5: US-A-6 062 604
D6: EP-A-1 102 208
D7: WO 99/65699 A.

2 The application does not meet the requirements of PCT Article 6 because claims 3-6, 8, 9, 11, 13, 14, 16, 17, 20 and 22-24 are not clear.

2.1 In claim 3 it is not clear what technical features the expression "selected in accordance with the contrast to be adjusted" defines.

2.2 In claim 4 the repetition of the feature wherein the relief structure is a diffraction grating serves no purpose. This objection also applies to claim 16.

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2.3	<p>In claim 5 the additional feature is not defined clearly, since the resolving power of the human eye is relative (it depends on the person concerned, see also the PCT Guidelines, chapter 5.34). This objections also applies to claim 13.</p>
2.4	<p>Claims 6, 8, 9, 14 and 17 intend to describe the features in terms of the X-axis or Y-axis. However, since these axes can be selected at random (they are not even part of the claimed subject matter, see also the PCT Guidelines, chapter 5.37), these features are not restrictive. Consequently, the above claims are not worded concisely, which makes it unreasonably difficult for a third party to determine the scope of protection sought.</p>
2.5	<p>The subject matter of claim 11 is inconsistent with claim 1. According to claim 1, when the depth of relief is varied, the period ranges from 20 μm to 200 μm, or is smaller than 300 μm. According to claim 11 the period would be between approximately 0.83 μm (1,200 lines per mm) and 1.25 μm (800 lines per mm).</p>
2.6	<p>In claim 17 it is not clear where the maximum depth and the minimum depth are. In other words, the point "depth = 0" is not defined. The claim is interpreted to mean that the difference between the minimum and the maximum depth is preferably 250 nm.</p>

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- 2.7 In claim 20 it is not clear how the shape of the relief is varied periodically.
- 2.8 In claim 22 it is not clear what the mean azimuth angle is (no reference point), and since the verification grating is not part of the claimed subject matter, it is impossible to detect restrictive features (see also the PCT Guidelines, chapter 5.37).
- 2.9 It is not clear what features claim 23 intends to describe. What is the "further change in function"? What does "accompanied" refer to: is there an interaction between the phase shift and the "further change in function"? In addition, the "further change in function" is not part of the claimed subject matter (see also the PCT Guidelines, chapter 5.37).
- 2.10 Claim 24 is not worded concisely because it does not explicitly state that it is dependent on claim 1. A wording such as, for example, "system [...] having an optical security element according to claim 1 and a verification element [...]" would have been more concise.
- 3 The subject matter of claims 1-3, 16-19, 22, 23 and 25, to the extent that it is interpreted correctly (see point 2. above) is not novel (PCT Article 33(2)).

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Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement*Claim 1:*

Document D2 discloses (see in particular column 10, lines 18-40) an optical security element having a substrate layer, wherein in a flat area of the substrate layer delimited by an X-axis and a Y-axis a relief structure defined by relief parameters is moulded for the purpose of producing an optically recognizable effect, wherein one or more of the relief parameters defining the relief structure are periodically varied in the flat area in accordance with a periodic parameter variation function, wherein the flat area is divided into one or more pattern areas (6, 7, 8, 9, 10) and a background area (11), wherein one or more of the relief parameters 'relief shape', 'depth of relief', 'spatial frequency' and 'azimuth angle', which define the relief structure, are periodically varied in the background area and the one or more pattern areas in accordance with a periodic parameter variation function, wherein the relief structure is a diffraction grating and the period of the parameter variation function ranges from 20 μm to 200 μm or is less than 300 μm (column 2, lines 43-45, column 5, lines 1-4, column 9, lines 28-36), and wherein the one or more relief parameters defining the relief structure, that is to say, 'relief shape', 'depth of relief', 'spatial frequency' and 'azimuth angle' are varied in the one or more pattern areas

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in accordance with a parameter variation function, which is phase-shifted relative to the parameter variation function of the background area.

The subject matter of claim 1 is broader than would appear to have been intended. In every relief structure at least one relief parameter is varied, that is to say, the depth of relief. If it was not varied, the surface would be flat and it would not be possible to talk about a relief structure. The novelty of the subject matter of claim 1 is anticipated by the fact that in document D2 the depth of relief is periodically varied.

Further comments:

In figure 6a of the present application the depth of relief is varied in accordance with two superposed parameter variation functions.

There is no discernible difference between an embossed structure and diffraction structure. Diffraction inevitably results when a surface is not flat, for example in the case of an embossed structure. Owing to the physical properties of light, every relief structure is a diffraction structure.

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citations and explanations supporting such statement*Claims 2, 3, 16-19, 22, 23 and 25:*

The subject matter of claims 2, 3, 16-19, 22, 23 and 25 is known from document D2.

Claim 2: column 10, line 40, to column 4, lines 29-30; column 6, line 4; claim 18: column 2, lines 25-27.

- 4 The present application does not meet the requirements of PCT Article 33(3) because the subject matter of claims 4-11, 20 and 24, to the extent that it is interpreted correctly (see point 2. above), does not involve an inventive step.

4.1 Claim 4

The subject matter of claim 4 is novel because the azimuth angle varies with a period of 20 μm to 200 μm or smaller than 300 μm . Document D2 discloses varying the azimuth angle (see column 2, lines 40-43). However, document D2 does not specify a period for the variation of the azimuth angle. The technical problem is that of finding a period for the variation of the azimuth angle. The typical variables for optical security elements range from a few micrometers to several millimetres.

Consequently, a person skilled in the art would choose values in this range, without thereby exercising inventive skill. The claimed interval of 20 μm to 200 μm or less than 300 μm is fairly wide. The application indicates no unexpected

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effects or properties relative to the rest of the range. According to page 7, lines 8-14, the advantage of the above range is that "to the human observer, the pattern area is indistinguishable from the background area". However, it is clear that the human eye is perfectly capable of distinguishing differences of approximately 1 mm, manages fairly well with 0.5 mm (that is to say, 500 μm) and does poorly at less than 100 μm . Consequently, the claimed interval is situated precisely in the range in which a person skilled in the art would expect the human observer to not be able to distinguish well. Naturally a person skilled in the art knows that this ability is even lower at less than 20 μm ; however, this is also the limit of what it is possible to produce. Consequently, a person skilled in the art would spontaneously choose a period of, for example, 100 μm . According to document D2, this is a normal value (see above). Consequently, the claimed interval cannot be considered inventive (see also the PCT Guidelines, chapter 13.14(e)(i) and (ii)).

4.2 Claim 10

The feature 'concentric circles' is well known (see document D7, page 21, lines 8-32) and, in the light of document D2, column 12, lines 37-45, a person skilled in the art would provide the optical security element of document D2 with this feature.

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4.3 Claim 11

These spatial frequencies are routine in the field (see, for example, document D1, column 6, lines 8-14, document D3, page 9, lines 23-29).

Consequently, a person skilled in the art would provide an optical security element with spatial frequencies of the above kind, without thereby exercising inventive skill (see also the objection under point 2. above).

4.4 Claim 24

The use of verification elements for verifying the authenticity of an optical security element is well known (see, for example, document D4, in particular column 2, lines 46-52, column 4, lines 22-30; document D5, in particular column 9, lines 1-10, figures 7-8; and document D6 (in particular column 4, line 39, to column 5, line 51, figures 1-4)). The principle whether relief structures are present or not remains the same. Consequently, a person skilled in the art would provide an optical security element according to claim 1 with a verification element of the kind described in documents D4, D5 or D6, without thereby exercising inventive skill.

4.5 Claims 5-9 and 20

Dependent claims 5-9 and 20 concern minor modifications a person skilled in the art would

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make on the basis of familiar considerations, especially since the resulting advantages are readily foreseeable. Consequently, the subject matter of claims 5-9 and 20 does not involve an inventive step.

5. Claims 12-15 and 21

5.1 Claim 12

The second-closest prior art is known from, for example, document D2.

An optical security element according to claim 12 differs from the disclosure in document D1 in that the spatial frequency is varied according to the parameter variation function with a period of between 20 μm and 200 μm , or less than 300 μm . In document D2 the spatial frequency is not varied.

The closest prior art is known from, for example, document D3.

An optical security element according to claim 12 differs from the disclosure in document D3 in that the period of the variation of the spatial frequency ranges from 20 μm to 200 μm or is less than 300 μm .

In document D3 (in particular page 9, lines 29-32), the spatial frequency is varied, the period

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being between 500 μm and 10,000 μm .

Consequently, the subject matter of claim 12 is novel (PCT Article 33(2)).

The effect of this difference is that the human eye cannot distinguish the pattern area from the background area without the use of a verification element.

The object of the invention is to find an alternative for achieving this effect.

If document D3 did not disclose specific values for the period, the argument made in point 4. above with regard to claim 4 would apply. However, since in document D3 the person skilled in the art is explicitly pointed away from the solution disclosed in claim 12, there can be no doubt as to inventive step.

The search report citations offer nothing to suggest the solution in claim 12. Consequently, the subject matter of claim 12 involves an inventive step (PCT Article 33(3)).

5.2 Claims 13-15

Claims 13-15 are dependent on claim 12 and therefore likewise meet the PCT requirements for novelty and inventive step.

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5.3 Claim 21

The feature of claim 21, that is to say, the fact that the width of the valleys of the relief structure is varied periodically according to the parameter variation function, the period being between 20 μm and 200 μm , or less than 300 μm , implies that the spatial frequency is varied in this way. Consequently, the arguments made above with respect to claim 12 also apply to claim 21.

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

Box I:

The amendments submitted with the letter of 2 May 2005 introduce substantive matter which, contrary to PCT Article 34(2)(b), goes beyond the disclosure in the international application as filed. The amendments in question are as follows:

In claim 1 the interval "between 20 μm and 300 μm " for the alternatives in which something other than the azimuth angle is varied.

In the original claim 3 two intervals are disclosed, that is to say, "smaller than 300 μm " and "from 20 to 200 μm ". The interval "between 20 μm and 300 μm " is not disclosed. On the original page 12 the interval "20 to 300 μm " is disclosed, but only in connection with the variation of the azimuth angle.

The above objection also applies to claim 24.